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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/532,827	04/26/2005	Naoki Hase	052478	8889

38834 7590 10/30/2008

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EXAMINER	
GOFF II, JOHN L	

ART UNIT	PAPER NUMBER
1791	

MAIL DATE	DELIVERY MODE
10/30/2008	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/532,827	HASE ET AL.	
	Examiner	Art Unit	
	John L. Goff	1791	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *23 July 2008*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 April 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

1. This action is in response to the amendment filed on 7/23/08.

2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 103

3. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

4. Claims 1 and 3-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase et al. (WO 01/32418 with U.S. Patent 7,101,455 used as a translation) in view of Minami et al. (U.S. Patent 4,805,690) and as evidence the American Heritage Dictionary definition of "room temperature".

Hase discloses a continuous method of producing a laminate suitable for use as a circuit board comprising providing a heat-resistant film including a resin containing a thermal fusible component (2 of Figure 1(a)), providing upper and lower metallic foils (1 of Figure 1(a)) (e.g. copper or steel), providing protective materials (3 of Figure 1(a)), laminating the film, foils, and

protective materials by pressing the substrates in a heated roll laminating apparatus (4 of Figure 1(a)) operated at 200 °C or higher to form a laminate (6 of Figure 1(a)) of the film bonded to the foils and the protective materials slightly contacted with the laminate, cooling the laminate, and removing the protective materials from the laminate (8 of Figure 1(a)) (Figure 1(a) and Column 4, lines 13-19 and Column 8, lines 16-39 and Column 11, lines 39-61). Hase is silent as to controlling the temperature in a width direction of the laminate in a cooling process after the lamination so that the temperature of the ends, i.e. lateral edges, of the laminate are the same as or higher than that of the center portion, it being noted Hase is not limited to any particular cooling means (Column 8, lines 29-39). Minami disclose a cooling roller for continuous cooling of a laminate that evenly and quickly cools the laminate across its full width to prevent any defects in quality of the laminate due to uneven cooling, i.e. considered controlling the temperature in a width direction of the laminate in a cooling process after the lamination so that the temperature of the ends, i.e. lateral edges, of the laminate are the same as or higher than that of the center portion (Column 1, lines 7-14 and 41-44 and Column 2, lines 23-25 and Column 4, lines 52-60). It would have been obvious to one of ordinary skill in the art at the time the invention was made to cool the laminate including metallic foils as taught by Hase using the cooling roller shown by Minami to evenly and quickly cool the laminate across its full width.

Regarding the limitation of "wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)", Hase teach as exemplary a lamination temperature of 260 °C and cooling to room temperature considered by the examiner to be 25 °C or below such that controlling the temperature in a width direction of the laminate in a cooling process as taught by Hase as modified by Minami includes controlling the temperature

within the range of 180 °C to (lamination temperature - 100 °C). In the event it is shown Hase as modified by Minami does not necessarily teach the claimed temperature range the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the lamination temperature in Hase as modified by Minami any of the temperatures suggested by Hase followed by controlled cooling of the laminate to any of the temperatures suggested by Hase such as room temperature a temperature conventionally considered below 25 °C (as evidenced by the American Heritage Dictionary definition of room temperature) to form a dimensionally stable laminate which temperatures are considered to meet the limitation of "wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)".

Regarding claim 5, Hase teaches the heat-resistant film may comprise a multilayer of a non-thermoplastic polyimide film having thermoplastic polyimide layers, i.e. a resin containing a thermally fusible component, provided on upper and lower surfaces thereof (Column 11, lines 39-61).

Regarding claim 6, Hase teaches the thermally fusible component of the heat-resistant film contains a thermoplastic polyimide in an amount of 50% by weight or more base on 100% by weight of the thermally fusible component (Column 5, lines 46-49).

Regarding claim 7, Hase teaches the metallic foil may comprise a copper foil having a thickness of 50 μm or less (Column 13, lines 24-30).

Regarding claim 8, Hase teaches the protective material may comprise a heat resistant polyimide film which is considered a non-thermoplastic polyimide film (Column 10, lines 1-10 and Column 11, lines 39-61 and Column 26, lines 49-50).

5. Claims 1-8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hase in view of Akashi et al. (WO 01/36122 with U.S. Patent 6,615,633 used as a translation) or Yamagishi (JP 03266626 and see also the abstract) and as evidenced by the American Heritage Dictionary definition of "room temperature".

Hase is described in full detail above. Hase is silent as to controlling the temperature in a width direction of the laminate in a cooling process after the lamination so that the temperature of the ends, i.e. lateral edges, of the laminate are the same as or higher than that of the center portion, it being noted Hase is not limited to any particular cooling means (Column 8, lines 29-39). It is noted Hase teaches a continuous process of heating a thermoplastic polymer considered to an at least partially molten state for fusing with a steel sheet in a hot roll process at temperatures including 300 °C followed by cooling to room temperature. It was known in continuous hot rolling of a steel sheet at a temperature between 100 and 750 °C followed by cooling that the cooling is performed by initially heating the ends, i.e. lateral edges, of the sheet to within ± 50 °C of the center portion of the sheet thereby controlling the temperature in the width direction during the cooling process of the sheet to prevent end waviness in the sheet as shown by Akashi (Column 1, lines 8-21 and Column 5, lines 5-12 and 40-43 and Column 6, lines 40-49 and Column 7, lines 15-19). Further it was known in cooling a thermoplastic polymer sheet in an at least partially molten state that the cooling is performed by initially heating the ends, i.e. lateral edges, of the laminate without heating the center portion of the sheet thereby controlling the temperature in the width direction during the cooling process of the sheet to prevent end waviness in the sheet as shown by Yamagishi (See the Figures and abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to

cool the laminate including metallic foils as taught by Hase by initially heating the ends, i.e. lateral edges, of the laminate without heating the center portion of the laminate as shown by Akashi or Yamagishi to control the temperature in the width direction during the cooling process of the laminate and prevent end waviness in the laminate. Absent any unexpected results, it would have been obvious to one of ordinary skill in the art at the time the invention was made to experimentally determine the temperature difference between the heated ends and center of the laminate as taught by Hase as modified by Akashi or Yamagishi as a function of preventing end waviness in the laminate wherein a temperature of up to 50 °C is specifically suggested by Akashi.

Regarding the limitation of "wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)", Minami teach as exemplary a lamination temperature of 260 °C and cooling to room temperature considered by the examiner to be 25 °C or below such that controlling the temperature in a width direction of the laminate in a cooling process as taught by Hase as modified by Akashi or Yamagishi includes controlling the temperature within the range of 180 °C to (lamination temperature - 100 °C). In the event it is shown Hase as modified by Akashi or Yamagishi does not necessarily teach the claimed temperature range the following rejection would apply. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the lamination temperature in Hase as modified by Akashi or Yamagishi any of the temperatures suggested by Hase followed by controlled cooling of the laminate to any of the temperatures suggested by Hase such as room temperature a temperature conventionally considered below 25 °C (as evidenced by the American Heritage Dictionary definition of room temperature) to form a dimensionally stable

laminate which temperatures are considered to meet the limitation of "wherein the temperature is controlled at least within the range of from 180 °C to (lamination temperature - 100 °C)".

Double Patenting

6. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. A nonstatutory obviousness-type double patenting rejection is appropriate where the conflicting claims are not identical, but at least one examined application claim is not patentably distinct from the reference claim(s) because the examined application claim is either anticipated by, or would have been obvious over, the reference claim(s). See, e.g., *In re Berg*, 140 F.3d 1428, 46 USPQ2d 1226 (Fed. Cir. 1998); *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970); and *In re Thorington*, 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) or 1.321(d) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent either is shown to be commonly owned with this application, or claims an invention made as a result of activities undertaken within the scope of a joint research agreement.

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

7. Claims 1, 2, 5, 6, and 8 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,101,455 in view of Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature". Claims 1-4 of U.S. Patent No. 7,101,455 fully encompass claims 1, 2, and 5-8 of the instant application except for a teaching of controlling the temperature in a width direction of the laminate in a cooling process such that the temperature of the ends of the laminate is the same as or higher than that of the center portion which is obvious in view of Minami or Akashi or Yamagishi as described above.

8. Claims 3, 4, and 7 are rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-4 of U.S. Patent No. 7,101,455, Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" as applied to claims 1, 2, 5, 6, and 8 above, and further in view of Tokabayashi et al. (JP 04033848). Claims 1-4 of U.S. Patent No. 7,101,455, Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" as described above fully encompass claims 3 and 4 except for a specific teaching of using a heated roll laminating apparatus as the thermal-press forming device. Tokabayashi et al. are exemplary of laminating copper foils and a heat-resistant film in the formation of a circuit board wherein the foils and film are laminated in a heated roll laminating apparatus (See the abstract). It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the thermal-press forming device taught by claims 1-4 of U.S. Patent No. 7,101,455 as modified by Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" a heated roll laminating apparatus as shown by Tokabayashi et al. to continuously form the laminate. Regarding claim 7, claims 1-4 of U.S. Patent No. 7,101,455 are silent as to the metal comprising copper foil. It would have been obvious to one of ordinary skill in the art at the time the invention was made to use as the metal layer in claims 1-4 of U.S. Patent No. 7,101,455 as modified by Minami or Akashi or Yamagishi and as evidence the American Heritage Dictionary definition of "room temperature" a copper foil as a known metal layer for forming a substrate useful as a circuit board as shown by Tokabayashi wherein absent any unexpected results it would have been obvious to one of ordinary skill in the art to determine the

specific thickness of the foil as a function of the specific use of the circuit board as doing so would have required nothing more than ordinary skill and routine experimentation.

Response to Arguments

9. Applicant's arguments filed 7/23/08 have been fully considered but they are not persuasive.

Applicants argue, "The Office Action takes the position that Minami discloses a lamination temperature of 260°C and cooling the laminate to room temperature, and that this corresponds with the controlling the temperature at least within the range of from 180°C to (lamination temperature -100°C). (Office Action, pages 4 and 6.) However, Minami does not disclose the lamination temperature of 260°C, and Minami does not disclose thermal lamination. As shown in the description and the drawings, the lamination of Minami is performed while cooling the lamination materials. For example, in Minami, a pressure roller 1 and a cooling roller 2 engage with each other at a pressure applying part or nip 3. (Col. 2, lines 57-59.) Furthermore, the laminating method disclosed in Minami corresponds to the process of producing the starting material of the present invention such as the heat-resistant film having thermal fusibility comprising more than one layer. The production of the starting material without thermally laminating with a copper foil does not require controlling the temperature as recited in claim 1.".

The examiner agrees that Minami does not disclose the specific lamination temperature of 260 °C. This assertion was a typographical error as it is Hase (the primary reference) that specifically discloses the lamination temperature of 260 °C. The examiner disagrees that Minami does not disclose thermal lamination. Minami teaches the cooling roll is for laminating

machines (Column 1, line 9). Minami also laminates by fusing a resin with a raw material paper by heating the resin to a fusable state, applying the resin to the paper, and cooling the resin to complete lamination. This is thermal lamination in the same manner as Hase wherein a resin is fused/laminated with a metallic foil by heating the resin to a fusable state, applying the resin to the foil, and cooling the resin to complete lamination. In any event, Hase teaches cooling the fusable resin is performed by contacting to a substance of a low temperature. Minami teaches cooling the fusable resin is performed by contacting to a cooling roll that evenly and quickly cools the laminate across its full width to prevent any defects in quality of the laminate due to uneven cooling, and Minami specifically teaches the cooling roll is used in laminating machines. In summary, one of ordinary skill in the art would have a reasonable expectation of success that cooling the laminate as taught by Minami to prevent defects would have the same effect in cooling the laminate taught by Hase as both are cooling a laminate including a fusible resin there being no specific teaching that cooling the laminate to prevent defects using the specific cooling roll requires anything other than a resin heated to its fusible state.

Applicants further argue, "Akashi relates to a metallic rolling, while the present invention does not relate to a metal foil itself. Akashi does not relate to the laminate but to the single layer which is the starting material of the present invention. Akashi does not disclose thermal fusibility. The production of the starting material, without thermally laminating with the heat-resistant film having thermal fusibility, does not require controlling the temperature as recited in claim 1.". and "Yamagishi relates to the forming process of a polyamide sheet (film), while the present invention does not relate to the film itself. Yamagishi may be applicable for the method of producing the heat resistant film which is a starting material of the present invention as recited

in claim 1. Yamagishi also does not disclose thermal lamination, because the method of producing the sheet disclosed in Yamagishi relates to the melt extrusion. Production of the starting material, without thermally laminating with the copper foil, does not require controlling the temperature as recited in claim 1.".

The examiner agrees neither Akashi or Yamagishi teach thermal lamination. However, Akashi evidence it was known in continuous hot rolling of a steel sheet at a temperature between 100 and 750 °C followed by cooling that the cooling is performed by initially heating the ends, i.e. lateral edges, of the sheet to within ± 50 °C of the center portion of the sheet thereby controlling the temperature in the width direction during the cooling process of the sheet to prevent end waviness in the sheet wherein Hase teaches heating a steel foil to 300 °C and cooling the sheet. Yamagishi evidences it was known in cooling a thermoplastic polymer sheet in an at least partially molten state that the cooling is performed by initially heating the ends, i.e. lateral edges, of the laminate without heating the center portion of the sheet thereby controlling the temperature in the width direction during the cooling process of the sheet to prevent end waviness in the sheet wherein Hase teaches heating a thermoplastic polymer sheet to a fusible state considered at least partially molten and then cooling the sheet. In view of the above one would readily expect that in heating and cooling thermoplastic polymer sheets and foils as in Hase that cooling such that the temperature of the ends of the materials are the same as or higher than that of the center portion would prevent end waviness there being no specific teaching or suggestion that cooling the individual materials to prevent defects would not also apply to cooling a laminate of the individual materials.

Conclusion

10. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

11. Any inquiry concerning this communication or earlier communications from the examiner should be directed to **John L. Goff** whose telephone number is **(571)272-1216**. The examiner can normally be reached on M-F (7:15 AM - 3:45 PM).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richard Crispino can be reached on (571) 272-1226. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/John L. Goff/
Primary Examiner, Art Unit 1791